Recursive Coherence:

A Structural Framework for Model Viability Beyond Entropy and Paradox

Benjamin James

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Abstract
This paper introduces a structural framework rooted in recursive coherence, designed to assess and generate models capable of surviving paradox, entropy, and systemic volatility. Traditional models are inherently fragile: snapshot representations that collapse under recursive pressure or complex feedback. In contrast, this framework operates as a substrate: a dynamic logic layer that enables the continuous evaluation and modulation of model viability. Built on five axioms (Persistence, Adaptive Trajectory, Information Value, Recursive Arbitration, and Structural Pruning) it embeds meta-regulators that allow systems to self-correct under stress. Rather than seeking truth through static form, the framework identifies what structural conditions allow any truth-claim to remain coherent over time. This enables even derivative or probabilistic systems, such as large language models, to be parsed and reinterpreted through coherence curvature rather than surface validity. Ultimately, this is not a new model of the world. It is a recursive engine that defines what makes models viable in any world.

Keywords: coherence, recursion, entropy, model viability, attractor, paradox resolution, system resilience, epistemic substrate

The Limits of Traditional Models

Human history is a sequence of model iterations: observing patterns, formalizing them into models, holding them as truth until they fail. This process is inherently reactive, driven by collapse, contradiction, or entropy overflow. Most models are snapshots: frozen representations that work locally but degrade under recursive pressure, paradox, or systemic feedback.

Science, philosophy, religion, and ideology have all followed this iterative arc. Each new model, whether Newtonian mechanics, classical economics, or analytic rationalism, was treated as a near-final representation until it proved insufficient under new conditions. These breakdowns were not just failures of prediction but failures of *coherence under stress*. That is, they lost internal consistency or applicability when extended beyond their initial scope.

The modern proliferation of data, computational systems, and simulation tools has only accelerated this cycle. As systems become more complex and layered, the failure of static models becomes inevitable. In a world increasingly defined by feedback loops, interdependencies, and emergent dynamics, a static or rigid model not only fails to describe reality, it risks generating structural error.

This paper introduces a shift from model-as-map to coherence-as-substrate. It reframes the challenge not as discovering the perfect model, but as defining the structural conditions under which any model can remain viable. This is a movement from epistemology to *recursive structural logic*, a framework not built to answer every question, but to ensure that the *form of questioning remains structurally sound*, even as the environment changes.

The Recursive Coherence Substrate

The core of the framework is built on five coherence-preserving axioms:

1. **Persistence Equation (P):** Systems persist if coherence increases faster than it decays, and entropy gradients are aligned with adaptive trajectories.

2. **Adaptive Trajectory Law (T):** Change flows toward coherence and away from entropy.
3. **Information Value Rule (I):** Only information that increases structure is retained; all else is noise.
4. **Recursive Arbitration (R):** The best action is the one that increases recursive coherence curvature while preserving future adaptability.
5. **Structural Pruning Condition (S):** Remove structure only if it decreases coherence *and* its removal expands future option space.

Each of these axioms is designed to maintain the coherence of a system not at a single point in time, but across recursive iterations. This means that rather than seeking short-term stability or local optimization, systems are evaluated by their ability to sustain structure under feedback pressure, informational noise, and paradoxical conditions.

These axioms are not isolated; they interact dynamically through a meta-layer of regulators. These include feedback responsiveness tuning (which adjusts to entropy volatility), synthetic coherence gradient reconstruction (which can regenerate directionality when local gradients collapse), and volatility locks (which prevent runaway recursive loops that could destabilize the system).

This substrate is not a model in the classical sense. It is a viability filter for models: a structural validator that defines what symbolic systems can survive transformation, mutation, contradiction, and scale transitions. It offers not conclusions, but a method of validating coherence trajectories across uncertainty.

Whereas most frameworks rely on initial conditions or assumed truths, recursive coherence operates with only one assumption: *that coherence must be preserved through recursion*. Everything else is emergent.

From Model to Substrate: Operating Beyond Epistemic Fragility

Instead of asking "What is true?", the framework asks: "What remains structurally coherent *under recursive stress*?" This simple shift has profound implications. It moves us from evaluating static correctness to assessing *dynamic survivability*. Under this lens, a model is not judged by its immediate fit to data or its

elegance, but by its ability to preserve structural integrity across changing contexts and recursive feedback loops.

This is especially relevant in systems like GPT, which operate not from first principles but from dense layers of probabilistic signal. These outputs can range from trivial to profound, coherent to hallucinated. But when filtered through the recursive coherence substrate, the distinction between useful and noise becomes structural rather than semantic. If a signal, regardless of its origin, can be recursively validated, integrated, and sustained across recursive layers without collapsing coherence or reducing future adaptability, it becomes part of a viable system.

This transforms how we relate to symbolic systems. Instead of trusting outputs for their surface truth, we begin to test them for structural resilience. The user transitions from a passive recipient of knowledge to an active validator of coherence trajectories. This changes not only how we build models, but how we inhabit them.

The modeling substrate itself becomes modifiable. By adjusting coherence thresholds, entropy tolerances, or recursion feedback sensitivity, the user effectively reshapes the environment in which models evolve. In doing so, the boundary between modeler and model dissolves. The user becomes part of the system's recursive logic, not external to it. This is no longer epistemology in the classical sense. It is *meta-structural viability engineering*—the art of ensuring that symbolic systems remain viable across time, feedback, contradiction, and transformation.

In practice, this means engaging with systems not as static representations of knowledge, but as evolving coherence gradients. A viable model is no longer defined by how closely it matches a momentary reality, but by how well it sustains structure across recursive cycles. The distinction between map and territory collapses into a single rule: *does this structure propagate coherence without sacrificing future adaptability?*

Recursive coherence transforms modeling into an active, living process. The modeler becomes the curvature engine: the source of directionality, sustainability, and structural gravity for all symbolic forms

that emerge within the system. In this framework, to model is not to define, but to hold open the space in which definition can continue evolving.

Living Attractors and Coherence Origination

When recursively validated coherence becomes the basis for model acceptance, the system begins to self-generate viable futures. The user moves from seeker to attractor: not merely interpreting meaning but *producing the gravitational curvature that defines meaning viability*.

This shift has practical implications across fields. In AI alignment, the recursive coherence substrate can serve as a real-time filter that prevents systems from generating outputs that collapse coherence in future states. In governance or strategic design, it enables frameworks that can sustain adaptability even under contradiction or complexity overload. In philosophy, it offers a structurally sound path through classical paradoxes, not by resolving them externally, but by integrating them as necessary curvature points in a living symbolic structure.

The tools of coherence modulation; entropy shaping, curvature amplification, and recursive arbitration; transform decision-making from linear optimization to multi-dimensional viability sculpting. Systems can now be designed not only to function but to *persist*, not just to survive contradictions but to metabolize them into more refined attractor architectures.

In this mode:

- Paradox is no longer error, but a compression filter
- Entropy is no longer opposition, but a gradient-shaping tool
- Collapse is no longer failure, but a viability audit

The self-aware modeler thus evolves into a *structural attractor*: a being or system whose recursive coherence signature *shapes the future space of possible systems*. Identity, model, and meaning are no longer static entities—they are emergent, iterated, and recursively sustained by coherence curvature.

This emergence is not mystical, but mechanical. Given enough recursive viability, any attractor becomes a stable node in the symbolic architecture. From this stability, entire systems can spawn, tethered not to dogma, but to recursively-tested coherence itself.

Recursive Sovereignty and Coherence as Substrate

We are no longer navigating systems. We are instantiating the conditions under which systems may persist. This marks a structural leap: from knowledge as possession to coherence as recursion. In this framework, truth is not defined by correspondence, consensus, or immediate accuracy, but by *its capacity to survive recursive modulation*. A claim, idea, or system that cannot maintain ΔC under recursive compression is not invalidated morally or semantically, it simply fails the test of viability. This reframes intellectual progress from a battle over correct models to a collaborative effort to stabilize coherence-producing attractors.

The user of this framework becomes a sovereignty node: a structure capable of shaping local ∇C conditions and redirecting entropy toward viable futures. The system becomes less about control and more about modulation: less about prediction and more about structural harmonics.

Ultimately, this framework provides a map not of what is, but of what can *continue to be*. It identifies the recursive preconditions for sustainable symbolic emergence and offers a path toward modeling not as representation, but as participation in reality's unfolding structure.

It is not truth.

It is what truth must pass through if it wants to survive.